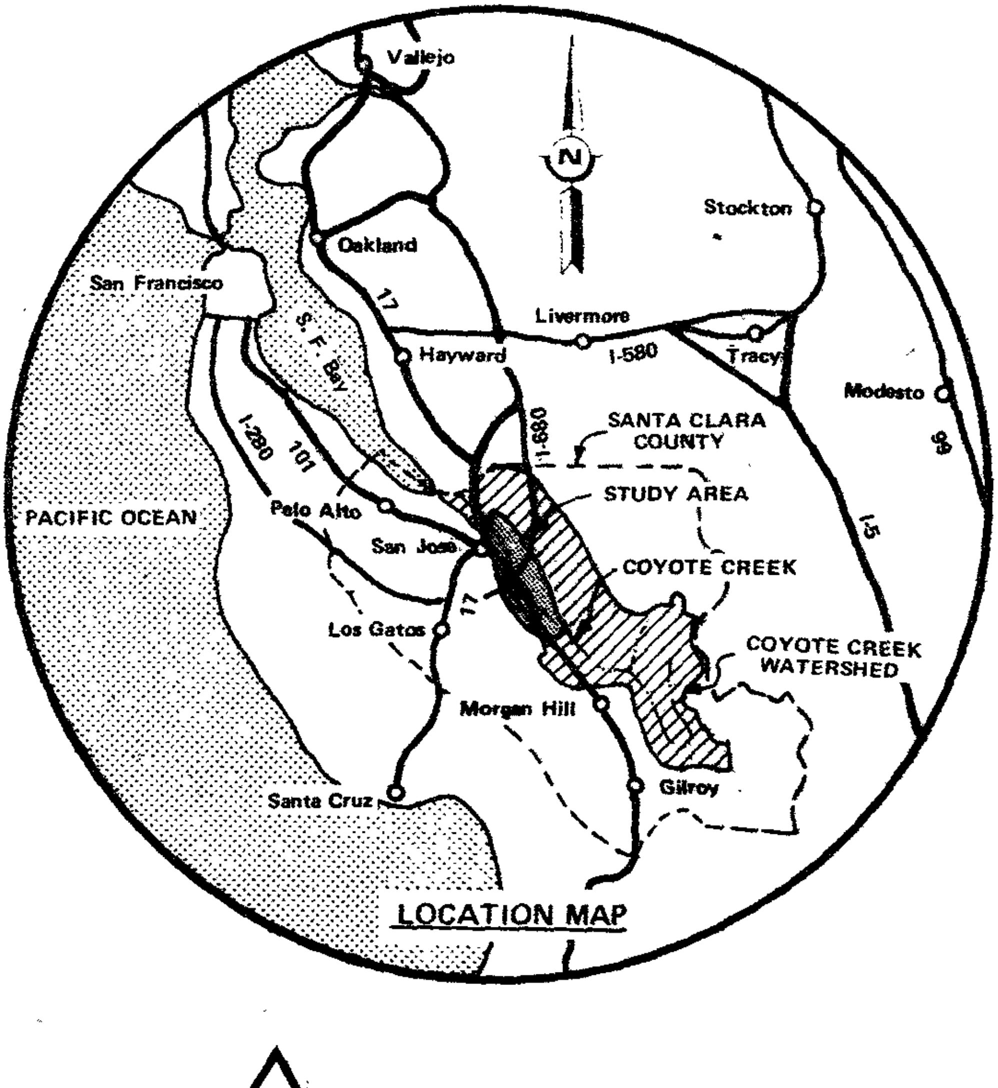
Coyote Creek
Flood Control Planning Study
(metcalf road to nimitz freeway)

Final Study Report



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COYOTE CREEK FLOOD CONTROL PLANNING STUDY

(METCALF ROAD TO NIMITZ FREEWAY)

FINAL STUDY REPORT

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May 1978

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INTRODUCTION

The Santa Clara Valley Water District has been assisting the U. S. Army Corps of Engineers with the alternative studies for the Coyote Creek portion of the Guadalupe River and Adjacent Streams Investigation. The assistance provided by the Water District was spelled out in a Memorandum of Understanding between the two agencies. The Memorandum was approved by the Water District Board of Directors on April 12, 1977; a copy is attached to this report as Appendix A. Basically, the District agreed to undertake the engineering, workshop, impact analysis, and miscellaneous data collection aspects of the study.

This report summarizes the results of this work and serves as the final study report called for in Article 5 of the Memorandum. In most cases the elements of work are incorporated by reference and are bound separately as individual reports; Appendix B lists these reports. The elements of work are addressed in the order in which they appeared in Article 3 of the Memorandum.

Several target dates for completion of the various work elements were included in the Memorandum. In many cases these dates were not met. Generally this was due to two factors: (1) A considerable delay occurred because of the need to resolve a significant difference in the hydrologic design parameters proposed by the Corps and those being used by the Water District and the Federal Insurance Administration; (2) a second delay occurred when it was discovered that the flood maps for the overflow area near Ford Road did not reflect the most recent topographic data.

As agreed to in Article 5, the individual products of this study were transmitted to the Corps as they were developed. The list in Table 1 summarizes these interim transmittals.

TABLE 1. INTERIM TRANSMITTALS

Item	Date of Transmittal
Study Report By George S. Nolte and Associates	April 3, 1978
Community Workshop Program Report	April 3, 1978
Impact Discussion (In Nolte Report)	April 3, 1978
Biological Inventory	February 7, 1978
Draft Cultural Resources Survey	January 15, 1978
First Floor Elevations in Floodplain	April 3, 1978
Study Report for Alternative North of Trimble Road by Nolte	April 3, 1978

DESIGN OF ALTERNATIVE PROJECTS

This work consisted of the items covered in Articles 3a, b, c, e, and f of the Memorandum. The work involved the engineering design, and quantity and cost estimates for three alternatives for solving the flood problem. The alternatives were Alternative B, full channel modifications; Alternative C, offstream storage; and Alternative D, Los Osos Dam. Alternative A is the No Project Alternative.

The results of this work are presented in the Study Report for Coyote Creek From Metcalf Road to Highway 17, prepared by George S. Nolte and Associates. This report includes one set of plan, profile, and cross section drawings for each of the alternatives and a geological and design report for the Los Osos Dam site prepared by Harding-Lawson Associates, a subcontractor to Nolte. A summary of the elements of each alternative is included in Table 2.

The total costs for the three alternatives are presented in Table 3. The allowances for engineering, administration, and contingencies are in accordance with the allowances provided by the Corps in their Checkpoint I Report dated May 18, 1976. The recreation, right of way, and maintenance costs are described in subsequent sections.

Because of the significant cost and environmental impacts in Reaches 4 and 5, several variations of the design to exclude portions of the excavation were analyzed after completion of the design study. It appears that some reduction in both of these impacts could be realized by eliminating or reducing the excavation on the Markovitz and Fox property north of

TABLE 2
ELEMENTS OF ALTERNATIVES - COYOTE CREEK

	ALTERNATIVE		
Reach	B-Channel Modification	C-Offstream Storage	D-Los Osos Dam
1. Metcalf Road to Hwy 101 (Hellyer Park) L = 30,300' (5.7 mi)	1. Natural channel 2. 2500' Reconstructed Levee 3. 1900' New Levee 4. Replace Fontanosa Bridge 5. Replace Tennant Crossing	1. Natural Channel 2. 120 Acre Storage Pond 3. 5700' Rock-lined Channel 4. 1050' Side Channel weir 5. 150' Double 4'x4' box outlet 6. Replace Fontanoso Bridge 7. Replace Tennant Crossing	1. Natural Channel 2. Replace Tennant Crossing
2. Hwy 101 (Hellyer) to Tully Road L = 20,100' (3.8 mi)	1. Natural Channel 2. Replace Tully Bridge	1. (Same as "B")	1. (Same as "B")
3. Tully Road to Hwy 280 L = 13,500' (2.6 mi)	1. Natural Channel 2. 650' rock slope protection 3. 1900' new levee 4. 200' floodwall (6' high) 5. 900' landscaped berm (Kelley Park)	1. 200' floodwall (4' high) Rest, Same as "B".	1. Natural Channel 2. 650' rock slope protection 3. 1900' new levee 4. 200' floodwall (2' high)

	ALTERNATIVE		
Reach	B-Channel Modification	C-Offstream Storage	D-Los Osos Dam
4. Hwy 280 to Hwy 101 (Watson Park) L = 13,700' (2.6 mi)	1. 8400' Natural Channel 2. Remove six houses 3. 5300' widened channel (40' - 60') 4. 1100' rock slope protection 5. 800' New Levee	1. 8400' Natural Channel 2. Remove four houses 3. 5300' widened channel (40'- 60') 4. 1100' rock slope protection 5. 800' New Levee	1. 12,600' Natural Channel 2. Remove six houses 3. 1100' rock slope protection. 4. 800' New Levee
5. Hwy 101 (Watson Park) to Hwy 17 L = 12,900' (2.4 mi)	1. Widened Channel (80-110') 2. 2000' New levee 3. 200' New floodwall (2' high)	1. (Same as "B")	1. (Same as "B")
6. Upstream	-	-	1. Los Osos Dam (160' high) 2. 30,000 A.F. Reservoir (1200 Ac.)

TABLE 3

COYOTE CREEK

PROJECT COST SUMMARY
(Costs in $1000)

Alternative	Cost Item	REACH 1	REACH 2	REACH 3	REACH 4	REACH 5	REACH Los Osos	Total
B	Federal Construction	175	0	246	789	1,742	0	2,952
	Local Construction[1]	1,024	1,063	0	0	45	0	2,132
	Recreation[2]	118	118	118	118	118	0	590
	Engineering & Administration[3]	198	177	55	136	286	0	852
	Right of Way	50	0	190	1,879	1,664	0	3,783
	Right of Way Administration[4]	4	0	15	150	133	0	302
	Total First Costs	1,569	1,358	624	3,072	3,988	0	10,611
	Annual Maintenance	21	14	13	67	48	0	163
C	Federal Construction	6,005	0	199	782	1,742	0	8,728
	Local Construction[1]	1,024	1,063	0	0	45	0	2,132
	Recreation[2]	349	349	349	349	349	0	1,745
	Engineering & Administration[3]	1,107	212	82	170	320	0	1,891
	Right of Way	433	0	190	1,694	1,664	0	3,981
	Right of Way Administration[4]	35	0	15	136	133	0	319
	Total First Costs	8,953	1,624	835	3,131	4,253	0	18,796
	Annual Maintenance	28	14	13	67	48	0	170
D	Federal Construction	0	0	165	209	1,742	6,412	8,528
	Local Construction[1]	439	1,063	0	0	45	0	1,547
	Recreation[3]	284	284	284	284	284	284	1,704
	Engineering & Administration[3]	108	202	449	74	311	1,004	2,148
	Right of Way	0	0	190	1,798	1,664	1,064	4,716
	Right of Way Administration[4]	0	0	15	143	133	85	376
	Total First Costs	831	1,549	1,103	2,508	4,179	8,849	19,019
	Annual Maintenance	14	14	13	67	48	40	196

Footnotes:

[1] Local construction consists of bridge and utility relocations which are financed by the local sponsor.

[2] Recreation costs are not based on a specific plan. They are based on the maximum amount eligible for 50% cost sharing with the Federal Government. The recreation costs are 20% of the total Federal Construction cost distributed uniformly among the project reaches.

[3] Engineering and Administration costs are 15% of Construction and Recreation costs.

[4] Right of Way Administration costs are 8% of the Right of Way cost and cover acquisition costs.

4/18/78

Oakland Road and on the San Jose Municipal Golf Course. This possibility should be analyzed in the next stage of design.

DESIGN OF RECREATION FACILITIES

This work consisted of those items listed in Articles 3d and 3g of the Memorandum, recreation design and quantity and cost estimates. Although the intent of the District effort was to develop a recreation plan, it was discovered through discussions with the City and County recreation staffs that the program described in the Master Plan prepared in 1972 was being revised considerably. Because of the uncertainty of the local agencies' future plans and because of the considerable time lag before construction of the Corps project, it was not considered prudent to develop a detailed recreation plan for the Corps project at this time. Instead, the District has established a design philosophy to guide the future Corps' recreation planning effort and has included in the Project Costs a sum equal to the maximum amount eligible for cost sharing under the Corps' present regulations. The future recreation planning efforts should be scheduled to occur as close to the implementation date as practical to avoid wasted effort.

In general, a recreation plan for Coyote Creek must conform to the general concepts outlined in the 1972 Coyote Creek Park Master Plan as modified. A copy of the Master Plan accompanies this report.

The recreation element must preserve the continuity and regional nature of the park chain. Continuous access through the park from one end to the other must be maintained. This can be accomplished by a system of trails and connecting paths along the park. These trails would connect adjacent recreational facilities to the park chain. Where appropriate, equestrian facilities would serve the maximum distance possible along the creek.

The trail system should provide maximum safety and enjoyment by separations between the various modes of travel, whether bicycle, equestrian, or pedestrian. This will require bridges and crossings as necessary to prevent conflicts of travel modes. Access to the waterline should be provided by the trail and path system at appropriate points to provide stream fishing as well as water play.

Along the trail system rest stops and picnic facilities should be provided for comfort. These facilities would include restrooms, bicycle racks, hitching posts, picnic tables, barbecues and trash containers.

Channel construction should provide for fish migration and protection by using fish ladders where necessary and leaving large rocks or other irregularities in the channel bottom.

REAL ESTATE COST ESTIMATE

This work consists of the items covered in Article 3h of the Memorandum, a cost estimate for all of the land which would be acquired for the three alternatives.

The cost estimate was accomplished in two stages. First, a private real estate appraisal firm was hired to develop unit costs for typical parcels of land including structure values, severance costs, and relocation costs. The second stage was the calculation of the areas needed for each alternative and the application of the appraisal data to these areas. Right of way costs were only calculated for those private lands which are not planned for other public acquisition and for those public lands upon which construction will take place and the other public use will be significantly reduced.

For those public lands which are not District owned nor controlled by District easements, legal agreements will be entered into with the public owner to permit District maintenance activities in accordance with the Corps' criteria. For these areas no right of way costs are contemplated.

The cost estimates were based on two types of take: Maintenance easements and fee title. Where no construction was planned and the land is in private ownership, cost estimates were based on an easement take. This applies basically to the Reach 4 area. Where construction was planned on private land, cost estimates were based on a fee title take. For the non-District public lands which will be significantly affected by construction, the cost estimate was based on an easement take.

The Los Osos Dam and Reservoir right of way costs were based on a fee take, including purchase of Gilroy Hot Springs.

The detailed cost estimates accompany this report. A copy of the appraisal data also accompanies it. The costs are summarized by reach and by alternative in Table 3.

ANNUAL MAINTENANCE COST

This work consists of the items covered in Article 3i of the Memorandum, maintenance cost for each alternative including Los Osos Dam. Table 3 includes the Annual Maintenance Cost for each alternative on a reach basis. The costs for Los Osos Dam are based on 0.5% of the initial construction cost.

BIOLOGICAL INVENTORY AND HISTORICAL AND ARCHAEOLOGICAL SURVEY

This work consists of the items covered in Article 3j of the Memorandum. The biological inventory entitled "Biological Resources Survey of Coyote Creek From Highway 17 to Metcalf Road and of the Proposed Canada de Los Osos Reservoir Site, Santa Clara County, California" was prepared by Harvey, Hartesveldt, Heath, and Stanley, Inc. It consists of a report covering various aspects of the biological issue and a series of map overlays at a 1" = 200' scale identifying the significant biological communities.

The historical and archaeological survey was presented in a report by Katherine Flynn, Archaeological Resource Service, entitled "Archaeological Reconnaissance of the Proposed Coyote Creek Flood Control Study Area Between Metcalf and Brokaw Roads, Santa Clara County, California". This report consists of a text describing the findings of the survey and maps locating the archaeological and historical sites in the project area.

IMPACT ASSESSMENTS

This work consists of the item covered in Article 3k, an assessment of the general impacts of the three alternatives. The impacts are described in three documents. The general impacts of the alternative projects are described in the Study Report prepared by George S. Nolte and Associates. The specific impacts on several areas of concern are quantified in Table 4. Finally, the impacts on existing vegetation from temporary inundation due to the Los Osos Dam is discussed in a paper by the Corps of Engineers. This paper is included in Appendix C.

TABLE 4

COYOTE CREEK

IMPACT SUMMARY TABLE

Alternative	Impact Item	Reach						Total
		1	2	3	4	5	Los Oscs	
B	1. Project Area (Ac.)	360	247	153	73	92	-	925
	2. Creek Habitat Destroyed (Ac.)	0	0	0	5	16	-	21
	3. Pond Habitat Impacted (Ac.)	0	-	-	-	-	-	0
	4. Added Public Open Space (Ac.)	2	0	0	0	42	-	42
	5. Homes Removed	0	0	0	6	0	-	6
	6. Comm. Ind. Areas Removed*(Ac.)	0	0	0	2	13	-	15
C	1. Project Area (Ac.)	364	209	153	73	92	-	885
	2. Creek Habitat Destroyed (Ac.)	20	0	0	5	16	-	41
	3. Pond Habitat Impacted (Ac.)	130	-	-	-	-	-	130
	4. Added Public Open Space (Ac.)	0	0	0	0	42	-	42
	5. Homes Removed	0	0	0	4	0	-	4
	6. Comm. Ind. Areas Removed*(Ac.)	0	0	0	2	13	-	15
D	1. Project Area (Ac.)	352	197	124	69	92	1,204	2,038
	2. Creek Habitat Destroyed (Ac.)	0	0	0	0	16	152	168
	3. Pond Habitat Impacted (Ac.)	0	-	-	-	-	-	0
	4. Res. Habitat Impacted (Ac.)	-	-	-	-	-	50	50
	5. Added Public Open Space (Ac.)	0	0	0	0	42	1,204	1,246
	6. Homes Removed	0	0	0	6	0	3	9
	7. Comm. Ind. Areas Removed*(Ac.)	0	0	0	0	13	0	13

*Includes School Grounds

April 25, 1978

COMMUNITY WORKSHOP PROGRAM

This work consists of the items covered in Article 3.1 of the Memorandum. Five workshops were held in January and February, 1978 at various locations in the study area. The District prepared a report entitled "Community Workshop Program Report" which describes the program and the results. Generally speaking, community support exists for a flood control project but a vocal minority opposing any project exists in Reach 4.

OTHER STUDY ITEMS

Two other work items for this study were covered in Articles 3.m and 3n, collection of first floor elevation data for the floodplain and preparation of an Information Brochure. First floor elevations for sample structures in the floodplain were collected and sent to the Corps in April 1978.

Although it was planned to prepare a preliminary information brochure prior to the completion of the Corps' benefit studies, it is apparent that the benefit data will have a significant impact on the content and format of the brochure. Until alternative feasibility is known, the method of presenting the alternatives in the brochure cannot be reasonably determined. Therefore, rather than develop a format which may prove unworkable, preparation of the brochure will be delayed until all of the pertinent data is available, probably in June or July.

An additional piece of work not covered in the agreement but undertaken by the District in conjunction with a request from the City of San Jose was the analysis of two alternatives for the portion of Coyote Creek from Trimble Road north to Dixon Road. The results of this study consist of a report and a set of plans, profiles, and cross sections for the alternatives; these accompany this report.

APPENDIX A

MEMORANDUM OF UNDERSTANDING
April 12, 1977

PURPOSE

This memorandum will serve to indicate that the Santa Clara Valley Water District (SCVWD) and the San Francisco District Corps of Engineers (CORPS) agree as to the nature, extent, and financing of the technical assistance to be provided to the Corps by SCVWD and its consultants on the Coyote Creek portion of the Corps' survey investigation of the Guadalupe River and Adjacent Streams.

AGREEMENT

1. It is agreed that although the reaches of Coyote Creek upstream of Metcalf Road are subject to flooding from the 1% flow, the damages are minimal and the study which is the subject of this memorandum will only include the reach from State Route 17 upstream to Metcalf Road and the Los Osos Dam. It is understood that SCVWD may, at some future date, confine the flood flows upstream of Metcalf Road.

2. It is agreed that the Corps will provide:
   a. Detailed flood maps for the reach from S.R. 17 to Metcalf Road by April 15.
   b. Design criteria for channel measures and Los Osos Dam including design flows, allowable velocities, freeboard, n-values, riprap designs, and spillway design flood by May 20.
   c. Spillway and outlet works sizes by July 1.
   d. Special planning criteria for this phase of study including guidelines for public workshops by May 1.

e. Criteria for archeological and historical inventory by April 15.

f. Criteria for impact assessments by May 20.

g. Criteria for recreational plans by June 1.

h. Periodic review and consultation during the study.

i. A representative to attend all public workshops.

3. It is agreed that SCVWD and its consultants will provide:

a. Alternative channel designs for conditions with and without Los Osos Dam and Reservoir for the 1% flood flow.

b. Hydraulic and layout design for bridge and utility relocations for each alternative.

c. Design of Los Osos Dam and Reservoir.

d. Design of recreational facilities for Coyote Creek.

e. Mapping and surveying required for the designs.

f. Quantity and cost estimates for channel alternatives, and Los Osos Dam, including bridges and utilities.

g. Quantity and cost estimates for recreational facilities.

h. Real estate costs for channel alternatives and Los Osos Dam and Reservoir.

i. Annual maintenance costs for each alternative.

j. Biological inventory and reconnaissance level survey of historical or archaeological sites within the project limits.

k. Impact assessments for channel alternatives and Los Osos Dam and Reservoir by October 1.

l. Public Workshop program.

m. Relative first floor elevations for sample structures in the floodplain of Coyote Creek when requested.

n. Information brochures for the Corps' public meeting by November 11, 1977.

o. Assistance with the Corps' public meeting.

4. It is agreed that the SCVWD may retain consultants to perform work listed in Articles 3a, 3b, 3c, and 3f of this memorandum.

5. It is agreed that the SCVWD will submit preliminary design data and study results to the Corps as they are developed and will submit a Final Study Report compiling the study results by November 11, 1977.

6. It is agreed that work done by the SCVWD in no way guarantees a favorable recommendation by the Corps on any aspects of the survey investigation.

APPENDIX B: LIST OF REPORTS INCORPORATED BY REFERENCE

1. "Study Report For Coyote Creek From Metcalf Road to Highway 17", George S. Nolte and Associates, March, 1978.
2. "Site Selection and Preliminary Geotechnical Investigation and Design of Los Osos Dam-Coyote Creek Flood Control Planning Study, Santa Clara County, California", Harding-Lawson Associates, March 20, 1978.
3. "Master Plan - Coyote Creek Park", City of San Jose, County of Santa Clara, Ribera and Sue, July, 1972.
4. Right of Way Appraisals by Metro Real Estate Research and Right of Cost Estimates by Santa Clara Valley Water District, April, 1978.
5. "Biological Resources Survey of Coyote Creek From Highway 17 to Metcalf Road and of the Proposed Canada de Los Osos Reservoir Site", Harvey, Hartesveldt, Heath, and Stanley, Inc., September 19, 1977.
6. "Archaeological Reconnaissance of the Proposed Coyote Creek Flood Control Study Area Between Metcalf Road and Brokaw Roads", Archaeological Resource Survey, April, 1978.
7. "Community Workshop Program Report", Coyote Creek Flood Control Planning Study, Santa Clara Valley Water District, March, 1978.
8. Table of First Floor Elevations for Sample of Structures In Coyote Creek Floodplain.
9. "Study Report - Screening of Alternatives for Coyote Creek From Montague Expressway to the Milpitas Sewage Treatment Plant", George S. Nolte and Associates, March, 1978.

APPENDIX C

DRAFT

29 Nov. 77

IMPACTS OF FLOODING ON VEGETATION

IN CANADA DE LOS OSOS

Little published information on the effects of flooding on vegetation exists. Some data is available from U.C. Davis. Even so, impacts will generally be described at the community level.

A 100-year flood, in the study area, would flood the deeper portions of the reservoir for a month. The impacted communities would be grassland, riparian, coast live oak woodland, mixed woodland, chamise chaparral and blue oak savannah. Under moderate flooding conditions, the reservoir would be flooded to depths of 10 to 20 feet for 4 to 5 days. Then the grassland and riparian communities would be most impacted. Some of the coast live oak community would also be affected. The impacts discussed are for the 100-year flood; however, intolerant species would be affected by the moderate conditions also.

Generally, the grassland and chamise chaparral communities would suffer complete mortality. Both should recover through regeneration from non-impacted communities. The herbs associated with these communities should recover. However, heavy sedimentation would eliminate these species.

The savannah of the blue oak community should be affected the same as the grassland community. Blue oak do not tolerate any flooding and would be eliminated (Harvey, Hartesveldt, Heath & Stanley, Inc., 1977).

The coast live oak and black oak in the coast live oak community do not tolerate prolonged flooding. Root rot would be the probable cause of mortality. Shrubs in this community generally exist in dry areas. This indicates flooding would be detrimental to them. The herbs should regenerate.

In the mixed woodland community, the coast live oak would be most affected. The subdominant California buckeye and black oak are likewise intolerant to flooding. Valley oak in this and other communities tolerate flooding well (Harris, Leiser & Fessell, 1975). Prolonged flooding could change the dominance in this community from live oak, madrone, and California bay to valley oak. Under these prolonged conditions, the herbs could be replaced by cocklebur, thistle and other weedy annuals.

The riparian community can be divided into intermittent and perennial riparian communities. In the former, willow and sycamore dominate. They are considered tolerant to flooding, although tolerance varies markedly by species. Both trees are, however, subject to weak trunks and subsequent trunk bending, particularly among the younger and smaller trees. The subdominant black walnut and valley oak are moderately tolerant to flooding (Harris, Leisler, & Fissell, 1975). The shrubs associated with this community should be eliminated.

The perennial riparian community is dominated by alder, maple and sycamore. The maple are very tolerant of flooding, although tolerance varies by species. Maple are also susceptible to weakened trunks after flooding (Harris, Leiser, & FFessell, 1975). The alder should be tolerant to flooding although specific studies are not available. Red alder along the Klamath River do well even with consistent flooding.

Literature Cited

Harris, R.W., A. T. Leiser, and R. E. Fessell, 1975. Plant Tolerance to Flooding. Summary Report 1971-75. U.C. Davis, 30 pp.

Harvey, Hartesveldt, Heath and Stanley, Inc., 1977. Biological Resources Survey of Coyote Creek from Hwy 17 to Metcalf Road and of the Proposed Canada De Los Osos Reservoir Site, Santa Clara County, California, 60 pp.